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Commercially Energy Drinks Consumption Reality among STAPS students in Boumerdès University - Algeria

واقع استهلاك المشروبات الطاقوية لدى طلبة التربية البدنية في جامعة بومرداس –الجزائر–

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Abstract:

The use of energy drinks is increasing in Algeria, yet there is a lack of local studies on the effect of energy drinks so far. This study sought to investigate the reality of commercially energy drinks consumption among STAPS students in ***Boumerdès*** University This study followed a descriptive approach. Total of **120** (Female: **40** / Male: **80**) from ***Boumerdès*** University STAPS students were selected using simple random sampling. A Questionnaire was used to collect data from the respondents,.The study revealed that **45.83%** of participants were regularly consuming energy drinks while **54.17%** were not. The energy drinks consumption ratios of the users versus non-user compared in terms of "gender", "age", "socioeconomic status", "living place", categories did not show any statistically significant differences **(p>0,05)**. In addition those who regularly use energy drinks reported that they do not know the harm of energy drinks. thus energy drinks consumption during physical activity is not recommended, and future studies are needed to determine harmful side effects of energy drinks.

Keywords*:* Energy Drinks; University; University student; Consumption

الملخص:

يتزايد استخدام مشروبات الطاقة في الجزائر، ومع هذا هناك نقص في الدراسات المحلية حول تأثير مشروبات الطاقة حتى الآن. سعت هذه الدراسة إلى التعرف على واقع استهلاك مشروبات الطاقة بين طلاب STAPS في جامعة بومرداس. اتبعت هذه الدراسة المنهج الوصفي، تم اختيار **120** طالب (إناث: **40** / ذكور: **80**) من طلاب جامعة بومرداس بطريقة عشوائية بسيطة، كما تم استخدام استبيان لجمع البيانات، وكشفت الدراسة أن **45.83**٪ من المشاركين يستهلكون مشروبات الطاقة بانتظام، بينما **54.17**٪ لا يستهلكونها، كما أن نسب استهلاك مشروبات الطاقة بالمقارنة بين المستهلكين مقابل غير المستهلكين من حيث "الجنس"، "العمر"، "الحالة الاجتماعية والاقتصادية"، "مكان المعيشة"، لم تظهر الفئات أي فروق ذات دلالة إحصائية**0 <p)**، **(05**، بالإضافة إلى ذلك، أفاد أولئك الذين يستهلكون مشروبات الطاقة بانتظام أنهم لا يعرفون ضرر مشروبات الطاقة، وبالتالي لا ينصح باستهلاك مشروبات الطاقة أثناء النشاط البدني، كما تقتضي الحاجة لدراسات مستقبلية لتحديد الآثار الجانبية الضارة لمشروبات الطاقة.

الكلمات المفتاحية: مشروبات الطاقة، الجامعة، الطالب الجامعي، الاستهلاك.

Introduction

Athletes and fitness enthusiasts are always looking for ways to improve their edge on performance. In doing so, they consume different types of supplements in an attempt to improve aerobic and anaerobic performance. One of the most popular supplements today is energy drinks.

Energy drinks are global public concerns due to their increased consumption by adolescents and young adults because they contain high amount of caffeine and sugar that may affect the health of the population. Energy drinks have many types that differ in the composition of their active ingredients. The active ingredients found in energy drinks are: Caffeine, Taurine, Guarana, Ginseng, Yerba mate, B vitamins, Ginkgo Biloba, L-Carnitine, Glucuronolactone, Creatine, Acai Berry, Milk Thistle, and L-theanine. Energy drinks contain some bio-active constituents that may stimulate the brain and could lead to harmful consequences to the health of their consumers. (Yunusa & Ahmad **2011**)

In recent years, energy drink consumption has been increasing rapidly in our country as in the whole world. Although the composition of energy drinks, which provides mental alertness, increases durability and energy, reduces fatigue and improves performance in general, varies among firms, it has been reported

to contain generally caffeine, guarana, glucuronolactone, taurine, ginseng, L-carnitine, sugar and vitamin B (Bulut et all., **2014**).

The ingredients in the content of the energy drinks have been reported to have tolerable effects for healthy people at low doses, especially in individuals with systemic disorders, which can lead to serious complications that can result in sudden death if taken in an overdose. When the literature related to this subject is examined, the unconscious consumption accelerates the heartbeat or rhythm disorder, reflux, restlessness, anxiety, muscle spasms, speech disorder, diuresis (urine increase), digestive system disorders, dehydration, insomnia, headache, hallucination, it is associated with serious health problems such as addiction, high blood pressure, gastric ulcer, cardiac arrest and coma (Gunja & Brown, **2012**; Wolk et al. **2012**). Energy drinks are frequently used by individuals who are engaged in sports as well as sedentary individuals. In terms of physical activity and sports activities, it can be considered that the biggest problem is sometimes the same as energy drinks and sports drinks due to ignorance or neglect.

It can be considered that it is important to determine the energy drinks consumption habits of individuals who are in the sports environment and to shed light on the advanced studies in this subject due to the risks reported frequently in the literature about energy drinks. In this context, the aim of this study is to determine the energy consumption habits among STAPS students in ***Boumerdès*** University.

❖ **Study questions:**

➢ **The general question:**

- What is the reality of the Energy Drinks Consumption among STAPS students in *Boumerdès* University?

➢ **Partial questions:**

1. Are there statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "gender"?
2. Are there statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "age"?

3. Are there statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "socioeconomic status"?
4. Are there statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "living place"?

- **General Hypothesis:**
  - STAPS students in *Boumerdès* University use Energy Drinks.
- **Partial Hypotheses:**
  - There are not statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of " gender".
  - There are not statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "age".
  - There are not statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "socioeconomic status".
  - There are not statistically significant differences between the energy Drinks consumption ratios of the users versus non-user in terms of "living place".

1-Literature Review:

1-1- Energy Drinks and Health:

Sipping a beverage that offers quick energy may appeal to people who feel fatigued or who believe the caffeine can provide an edge when exercising or playing competitive sports. Although statements on the websites of energy drinks warn that these beverages may not be suitable for children, youth are among their largest consumers. An energy drink may be used by adolescents or college students cramming for exams through the night, or by a young athlete before an important game. While it is true that some controlled trials have shown temporary improved alertness and reversal of fatigue after taking energy drinks, as well as enhanced physical performance in young athletes, the majority of studies show an association with negative health effects. These include increased stress,

aggressive behaviors like fighting, alcohol/cigarette abuse, increased blood pressure, increased risk of obesity and type 2 diabetes, poor sleep quality, and stomach irritation. (Al-Shaar et all., **2017**).

1-2- Safety issues related to energy drinks consumption:

Caffeine is a mild stimulant and is commonly found in coffee, tea, chocolate, and soft drinks. The concentration of caffeine in these products has been reported to range from 40 to 150 mg. (lieberman, **2003**).

In contrast, the top selling energy drinks have caffeine levels that range from 75 to 174 mg per serving, while in some of the higher caffeine energy drinks, levels may exceed 500 mg per serving. (Reissig, Strain & Griffiths, **2009**)

The adverse effects seen with caffeine in these doses include insomnia, nervousness, headache, and tachycardia. (Clauson, et all, **2003**), however, changes in the blood pressure response have been inconclusive. Several studies have reported significant elevations in systolic blood pressure. (Hoffman, et all, **2003**)

Differences between the studies are not clear, but they are likely related to differences within the combination of ingredients that are generally associated with these energy drinks. These studies have consistently shown no alterations in diastolic blood pressure. Interestingly, a recent discussion of the safety issues associated with energy drinks suggested that the products that are generally added to these supplements such as guarana, ginseng, and taurine are in concentrations that are far below the amounts associated with adverse events (Clauson, et all, **2003**)

1-3- Energy drinks and athletic performance:

Energy drinks are often used by athletes as a pre-exercise or pre-game supplement to either enhance the quality of their workout or improve athletic performance. Although caffeine has been used as an ergogenic aid for many years, consistent benefits have only been seen during endurance activities, in which time to exhaustion is often reported to increase. (Doherty & Smith **2004**)

This delay in fatigue is thought to be related to caffeine's ability to alter exercise metabolism by enhancing fat oxidation, thereby preserving muscle glycogen content.

Although caffeine has also been suggested to augment strength and power performance by enhancing muscle contraction efficiency through accelerated mobilization of intracellular calcium ions from the sarcoplasmic reticulum and/or by enhancing glycolytic regulatory enzyme kinetics. (priet, **1995**).

Caffeine is the primary ingredient in energy drinks shown in adults to enhance physical performance by increasing endurance and strength, improving reaction time, and delaying fatigue, though the effects are highly variable among persons. (Wiggers, et all, **2019**) These effects have not been studied in children and adolescents. There is a risk of caffeine abuse or toxicity in youth, so the American Academy of Pediatrics recommends a limit of less than 100 mg caffeine daily for ages 12-18 years. (Al-Shaar et all., **2017**).

The International Society of Sports Nutrition (ISSN) issued a position statement on energy drinks after analyzing their safety and efficacy. (Campbell et all., **2013**). They concluded that consuming energy drinks 10-60 minutes before exercise can improve mental focus, alertness, anaerobic performance, and endurance in adults, largely through the effects of caffeine. However, other ingredients in these drinks require more study to demonstrate their safety and effects on performance. ISSN cautioned that higher-calorie energy drinks can lead to weight gain, and that their high glycemic load could negatively affect blood glucose and insulin levels. They discouraged use of energy drinks for children and adolescents unless under careful parental monitoring, and for people with diabetes or cardiovascular disease who could be negatively affected by the stimulant ingredients.

The American Academy of Pediatrics' Committee on Nutrition and the Council on Sports Medicine and Fitness encourage pediatric health care providers to discourage the use of and discuss potential health risks of stimulant ingredients in energy drinks with youth and parents, and to limit or avoid sugar-sweetened beverages of any kind in youth due to risk of

excessive calorie intake and weight gain, as well as dental erosion. (Schneider & Benjamin, **2011**)

2- Materials and Methods:

2-1- Research Design:

The descriptive approach was used in this study because the research is descriptive in nature. This approach was chosen because it involves collection of data in order to answer questions concerning the current status of the subjects of the study.

2-2- Population and study sample:

In this study, the target population consisted of all STAPS students in *Boumerdès* University – Algeria. Sampling means selecting a given number of subjects from a defined population as representative of that population. **120** STAPS students were selected using simple random sampling. Simple random sampling enhances equal and independent chance of being selected as a member of the sample. The sample size consisted of **120** STAPS students.

2-3- study Instruments and Procedures:

The main tool of data collection for this study was questionnaire. In this study questionnaire is convenient because all the STAPS students in the sample were literates and were able to fill the questionnaire without difficulty. The questionnaire was used to collect data from STAPS students.

- **Psychometric test properties:**

❖ **Test validity:**

Validity refers to the degree in which our test or other measuring device is truly measuring what we intended it to measure.

During the questionnaire construction quality control and validity was ensured through face validity, where the instruments were subjected to researcher's supervisors to check whether it measured what it was intended for.

The questionnaire form, which is used as a data collection tool, was prepared by the researchers by using the questionnaire

forms used in the previous studies. Before the main study, the questionnaire form was applied with a 10-day interval in a group of 20 similar to the same sample group. The consistency of the responses was checked by comparing the first and last questionnaire responses of the participants. the opinions of the participants and a statistical expert about the general structure of the questionnaire were taken. In accordance with the suggestions, the survey questions were revised again.

2-6- Data Analysis:

Basic descriptive statistics were calculated (mean value and standard deviation frequency, percentage etc.) χ^2 Chi Square. test was used to determine the differences between categorical variables. The significance level was accepted as **p <0.05** in all analyses After the data collection, the researcher checked for the instrument completeness, accuracy and uniformity. The next step was coding of the data information. The purpose of coding was to classify the answers from the questionnaires into meaningful categories so as to bring out the essential pattern. A code state was prepared in the statistical Package for Social Science (SPSS) computer package. Then the data collected was entered in to the computer using (SPSS).

3. Results*:*

Table 1: The Energy Drinks Using Rates of the participants.

Using energy drinks		
Yes	n	55
	%	45.83%
No	n	65
	%	54.17%
Total	n	120
	%	100

As it is shown in **Table 1**, it was found that **45.83%** of the participants used energy drinks when the data obtained with the data collection tools were examined. In contrast, **54.17%** of the participants reported that they did not use energy drinks.

Table 2: The result of the comparison of the groups using and not using energy drinks in terms of their gender.

Using energy drinks		Gender					
		Male	Female	Total	χ^2	*df*	P
Yes	N	35	20	55	1.17	1	0.27
	%	29.17	16.66	45.83%			
No	N	35	30	65			
	%	29.17	25	54.17%			
Total	N	70	50	120			
	%	58.34	41.66	100			

The comparison of the groups using and not using energy drinks in terms of their gender is shown in **Table 2**.
As seen in **Table 2**, the proportional differences between the use of energy drinks and gender are not statistically significant [χ^2 (**1**) = **1.17**, **p** = **0.27**].

Table 3. The result of comparison of the groups using and not using the energy drinks in terms of their age groups.

Using energy drinks		Age groups							
		19-21	22-24	25-26	26+	Total	χ^2	*df*	p
Yes	n	17	21	10	7	55	0.97	3	0.80
	%	14.17	17.5	8.33	5.83	45.83%			
No	n	17	23	13	12	65			
	%	14.17	19.16	10.84	10	54.17%			
Total	n	34	44	23	19	120			
	%	28.33	36.67	19.16	15.84	100			

The comparison of the groups using and not using energy drink in terms of their age groups is shown in **Table 3**.
As seen in **Table 3**, there is no statistically significant difference between the participants' energy drinks usage and their age groups [χ^2 (**3**) = **0.97**, **p** = **0.80**].

Table 4: The result of the comparison of the groups using and not using energy drink in terms of their socio-economic status.

Using energy drinks		Socio-economic status							
		Top level	Under Level	Moderate level	Low level	Total	χ^2	*df*	p
Yes	N	10	13	20	12	55	2.23	3	0.52
	%	8.33	10.84	16.66	10	45.83%			
No	N	10	23	22	10	65			
	%	8.34	19.16	18.33	8.34	54.17%			
Total	N	20	36	42	22	120			
	%	16.66	30	35	18.34	100			

The comparison of the groups using and not using energy drink in terms of their socio-economic status is shown in **Table 4**.
As seen in **Table 4**, there is no statistically significant difference between the participants' energy drink usage and their socio-economic status [χ^2 (**3**) = **2.23**, **p** = **0.52**].

Table 5: The result of the comparison of the groups using and not using energy drink in terms of their living place.

Using energy drinks		living place						
		Family	Alone	campus	Total	χ^2	*df*	p
Yes	n	24	1	30	55	1.24	2	0.53
	%	20	0.83	25	45.83%			
No	n	35	1	29	65			
	%	29.17	0.83	24.17	54.17%			
Total	n	59	2	59	120			
	%	49.17	1.66	49.17	100			

The comparison of the groups using and not using energy drink in terms of living place is shown in **Table 5**
As seen in **Table 5**, there is no statistically significant difference between the participants' energy drink usage and their living place [χ^2 (**2**) = **2.23**, **p** = **0.52**].

4. discussion*:*

In light of the statistical findings of this study with regard to the consumption of energy drinks **45.83%** of the participants stated that they used energy drinks, while **54.17%** of the participants reported that they did not use energy drinks. In the same context, in a study conducted by (Bulut et al, **2014**), it was reported that **46.5%** of the participants used energy drinks, In another study conducted on university students in Turkey, it was found that **39.7%** of the students used energy drinks (Şen, Dere and Şen, **2015**), in a similar study also, **42.2%** of the participants stated that they used energy drinks,(Eren Uluöz et al, **2018**).

Considering the findings of the mentioned previous studies that reported the high consumption rates of energy drinks, it can be considered that this is the intense and effective marketing strategies of the energy drinks companies and its impact on the target population in these study.

In addition, the findings indicate that energy drinks consumption rates did not show a statistically significant differences between the groups in terms of gender, age, socioeconomic status and place of living, categories **(p> 0.05)**. In that same context, when the participants' reasons for consuming energy drinks were examined, in the study of (Eren Uluöz et al). it was stated that "being vigorous or energetic" and "keeping energy high in sports" are reasons with the highest frequency. It can be thought that the energy consumption habits of Physical Education students are related to the increasing energy needs in daily life without any relationship with sociodemographic variables, (Eren Uluöz et al, **2018**). Different researchers also reported that the mentioned variables were not related to energy drinks consumption (Bulut et al., **2014**; Şen, Dere and Şen, **2015**; Sipahi, Sönmez and Aydın, **2015**).

Although there are such clear warnings about the harm to human health of energy drinks, the reasons for using the most preferred energy drinks by the participants are reported as "keeping energy high during sports". In a previous study, it has been demonstrated that the use of energy drinks may allow one to perform more total repetitions during bench press exercises, and possibly during leg press exercises, at moderate intensity (Forbes, et al, **2007**).

In this context, while the most common reason for the energy consumption of STAPS students is "to keep their energy high during sports", there are some findings that show the contrary. Because in the STAPS course curriculum, students are given many courses related to human health such as nutrition, anatomy and sports control, sports medicine. Another remarkable reason is those using regular energy drinks do not know the damages of the energy drinks. In other studies, conducted in similar samples in Turkey, it has been reported that students do not know about the harms of energy drinks. (Sipahi, Sönmez and Aydın, **2015**; Şen, Dere and Şen, **2015**).

Conclusion

In conclusion, the study revealed that energy drinks consumption rates did not show a statistically significant differences between the groups in terms of gender, age, socioeconomic status and place of living, categories **(p> 0.05)**. Although the consumption of low amounts of energy drinks provides some advantages in keeping students' energy high during sports, it can be stated that the use of energy drinks in an excessive and unconscious manner can trigger many health problems, thus the official regulation on these beverages should necessitate the presence of a sort of responsible communication like a label on the health hazards of energy drinks in their packaging. For example, it is a legal obligation to have warning labels such as; "it is not an athlete's drink", "it should not be consumed for rehydration during and after intense physical activity", "it is not recommended to consume more than 500 ml daily".

In light of the findings of this study, future studies are needed to determine harmful side effects of energy drinks, which should focus on examining the effects of energy drinks consumption on special groups such as athletes and individuals with chronic systemic disorders, this may reduce unconscious consumption which may cause serious health problems. As for the participants themselves, the researchers recommended the clarification of the major differences between athletic beverages and energy drinks, which should be taught clearly in all courses

related to human health such as physiology, sports health, sports nutrition, sports medicine, as a positive way to put students in the picture concerning the harms of energy drinks.

References :

1. Al-Shaar L, Vercammen K, Lu C, Richardson S, Tamez M, Mattei J. Health Effects and Public Health Concerns of Energy Drink Consumption in the United States: A Mini-Review. ***Front Public Health***. 2017; 5:225.
2. Bulut, B., Beyhun, N. E., Topbaş, M., & Can, G. (2014). *Energy drink use in university students and associated factors. Journal of community health, 39*(5), 1004-1011. https://doi.org/10.1007/s10900-014-9849-3
3. Campbell B, Wilborn C, La Bounty P, Taylor L, Nelson MT, Greenwood M, Ziegenfuss TN, Lopez HL, Hoffman JR, Stout JR, Schmitz S, Collins R, Kalman DS, Antonio J, Kreider RB. *International Society of Sports Nutrition position stand*: energy drinks. ***J Int Soc Sports Nutr***. 2013 Jan 3;10(1):1.
4. Clauson KA, Shields KM, McQueen CE,and Persad N. Safety issues associated with commercially available energy drinks.J *Am Pharm Assoc* 48: e55–e63, 2003.
5. Doherty M and Smith PM. Effects of caffeine ingestion on exercise testing: Ameta-analysis. *Int J Sport Nutr Exerc Metab*14: 626–646, 2004.
6. Eren Uluöz, Ayşe Gencer, Sibel Kamışlı. (2018). A Study on Awareness of Energy Drinks of Physical Education and Sports (Pes) Students. *Journal of Education and Training Studies*, 6(12), 239-246. https://doi.org/10.11114/jets.v6i12.3722
7. Forbes, S. C., Candow, D. G., Little, J. P., Magnus, C., and Chilibeck, P. D. (2007). Effects of Red Bull Energy Drink on repeated Wingate cycle performance and bench-press muscle endurance. *International Journal of Sports Nutrition and Exercise Metabolism, 17,* 433 – 444.
8. Gunja, N., & Brown, J. A. (2012). *Energy drinks: health risks and toxicity*. Med J Aust, *196*(1), 46-49. https://doi.org/10.5694/mja11.10838
9. Hoffman JR, Kang J, Ratamess NA,Jennings PF, Mangine G, and Faigenbaum AD. Thermogenic effect from nutritionally enriched coffee consumption. *Int Soc Sports Nutr* 3: 35–41, 2006.
10. lieberman HR. Nutrition, brain function and cognitive performance. *Appetite* 40: 245–254, 2003.
11. priet LL. Caffeine and performance. *Int JSport Nutr* 5: S84–S99, 1995.

12. Reissig CJ, Strain EC, and Griffiths RR.Caffeinated energy drinks—A growing problem. *Drug Alcohol Depend* 99: 1–10, 2009.

13. Şen, L., Dere, H. E., & Şen, İ. K. (2015). Survey on Consumption Behaviour of Energy Drink Among University Students: Example of Afyon Kocatepe University. *Turkish Journal of Agriculture-Food Science and Technology, 3*(6), 394-401. https://doi.org/10.24925/turjaf.v3i6.394-401.264
14. Sipahi, H., Sönmez, İ., & Aydın, A. (2014). Enerji İçecekleri ve İnsan Sağlığı Üzerindeki Etkileri. *Turkiye Klinikleri Journal of Pharmacy Sciences, 3*(1), 39-46. http://www.turkiyeklinikleri.com/article/en-enerji-icecekleri-ve-insan-sagligi-uzerindeki-etkileri-69434.html

15. Schneider MB, Benjamin HJ. Sports drinks and energy drinks for children and adolescents: Are they appropriate? *Pediatrics.* 2011;127(6):1182–9.
16. Wolk, B. J., Ganetsky, M., & Babu, K. M. (2012). Toxicity of energy drinks. *Current opinion in pediatrics*, *24*(2), 243-251. https://doi.org/10.1097/MOP.0b013e3283506827
17. Wiggers D, Asbridge M, Baskerville NB, Reid JL, Hammond D. Exposure to Caffeinated Energy Drink Marketing and Educational Messages among Youth and Young Adults in Canada. *Int J Environ Res Public Health*. 2019 Feb 21;16(4).
18. Yunusa I, Ahmad I. Energy- Drinks: Composition and Health Benefits. *Bayero J Pure Appl Sci*. 2011; 4(2): 186-91.